SYNERGY ENVIRONMENTAL, LLC

January 14, 2015

Mr. Scott Green, RG
Remedial Projects Unit Manager
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, AZ 85007

Re: RESPONSE TO COMMENTS: REVIEW OF REVISED OPERATION AND MAINTENANCE PLAN – ROOSEVELT IRRIGATION DISTRICT WELLHEAD TREATMENT SYSTEMS
West Van Buren WQARF Registry Site
Phoenix, Arizona

Dear Mr. Green:

Synergy Environmental, LLC, on behalf of the Roosevelt Irrigation District (RID), has reviewed and provided the following responses to additional comments by the Arizona Department of Environmental Quality (ADEQ) on the *Operation & Maintenance Plan, RID Wellhead Treatment Systems* (O&M Plan), dated October 2014 (Revision 4), received on December 15th, 2014. As requested, our responses to ADEQ comments are being submitted within 30 calendar days of the date of ADEQ's letter.

RESPONSES TO ADEQ REQUIRED INFORMATION

Comment #1: *"In accordance with A.A.C. R18-16-411(E)(4), the O&M Plan shall include 'a process for the treatment system operator to promptly notify potentially affected water providers of a failure of a key treatment system component that could affect the quality of a discharge of treated water.'*

ADEQ disagrees with RID's response that there are not other potentially affected water providers that could be affected by 'a key treatment system component that could affect the quality of a discharge of treated water.' ADEQ requests that RID consider the entities surveyed in the Land and Water Use Study included in the final West Van Buren Water Quality Assurance Revolving Fund (WQARF) Remedial Investigation, dated August 2012.

RID's Response:
Respectfully, the entities that qualify as "water providers" for ADEQ's Land and Water Use Study performed under its broad Remedial Investigation of the WBVA WQARF Site, are not the same "water providers" that would be affected by a change in the water quality of a discharge from RID's treatment system.

There are no "affected water providers" other than RID. There are no physical interconnections with the City of Phoenix or the City of Tolleson. While there are physical interconnections between the RID water conveyance system and SRP irrigation laterals (which have not been used in years), SRP has already proclaimed their position that the RID water, in its untreated state, is acceptable for use as irrigation water.

There is no physical means of potentially affecting any water provider other than RID. Without any physical means to convey potentially untreated or partially treated water to municipal water providers, for use as drinking water, RID again maintains that there is no need to provide notification in the event of a treatment system upset.

RID has, however, added information in Section 4.1 of the O&M Plan to clarify this matter and provide for O&M Plan revision in the event that treated groundwater is to be conveyed to a potable water provider that could potentially be affected by failure of key treatment system component(s). These provisions require establishment of a process for prompt notification of potentially affected water providers, consistent with A.A.C. R18-16-411(E)(4). This additional language has been added to Section 4.1 in the revised O&M Plan (Revision 5) as follows:

> Treated water from the wellhead treatment systems currently is exclusively discharged to RID canals and laterals for agricultural use. Consequently, there are no other potentially affected water providers within the WVBA Site that would be affected by a discharge of treated water in the event of significant process control issues or failures at any of the wellhead treatment systems. However, at such time in the future when RID plans to serve treated water to persons or parties for municipal and industrial end use, the O&M Plan will be revised to identify the affected water provider(s) and the process by which RID will promptly notify those water providers of any failure of a key treatment system component that could affect the quality of the discharge of treated water. The revised O&M Plan will be submitted for ADEQ approval at least 90 days prior to initiation of water delivery to the affected water provider(s).

<u>Comment #2:</u> "ADEQ requests that RID submit a response to comments letter within 30 calendar days from the date of this letter. Once received, ADEQ will review, and if appropriate, provide approval pursuant to A.A.C. R18-16-411(E) and 'certification by the

Department that the elements of the operations and maintenance plan adequately protect public health against treatment system failure' in accordance with A.A.C. R18-16-411(E)(1). Once ADEQ has determined that approval and certification are appropriate, ADEQ will request RID to submit a final revised O&M Plan upon which RID will receive approval and a certification letter."

RID's Response:
As requested, this letter includes responses to ADEQ's additional comments on the O&M Plan. Upon approval by ADEQ, changes to the O&M Plan will be incorporated and RID will submit the final revised O&M Plan (Revision 5) as requested.

RESPONSES TO ADEQ RECOMMENDATIONS

Comment #3: Section 4.4.2 – Bypass Mode, page 20
"ADEQ requests that RID provide information in this section regarding whether the system is ever operated in a partial bypass mode and what happens to the SCADA system when the facility is operating in the full/partial bypass mode."

RID's Response:
As requested, information regarding whether the system is ever operated in a partial bypass mode and what happens to the SCADA system when the facility is operating in the full/partial bypass mode has been added to Section 4.4.2 in the revised O&M Plan (Revision 5) as follows:

> There is a routine occurrence when operation in partial bypass mode is necessary at the RID-92 wellhead treatment system. Since there is only one treatment skid at RID-92, partial bypass is necessary during carbon change out activities to fluidize the GAC for removal and refilling activities, and backwashing. Partial bypass is necessary in this case to prevent excessively high flow rate during backwash, which could result in possible loss of GAC. Since all other treatment systems utilize two or three treatment skids, this mode of routine partial bypass is only necessary at the RID-92 wellhead treatment system.
>
> During full or partial bypass operation, the SCADA system is still functioning and the change in flow path is shown on the control screens and captured by data acquisition. When this occurs, the wellhead pressure will decrease and flows will increase (due to reduced pressure head). During full bypass mode operation, pressure differential across the lead and lag vessels goes to zero, and therefore, no alarms are triggered.

Comment #4: Section 4.5.1 – Well Pumps "Shut Down Conditions", page 23:
"ADEQ requests that RID provide a discussion of the sump water level shut down conditions."

RID's Response:
As requested, a discussion of the sump water level shut down conditions has been added to Section 4.5.1 in the revised O&M Plan (Revision 5) as follows:

> When water (e.g., rain water or process water) accumulate in a sump, a high-level switch alarm will result when water reaches the first float alarm point. The Operator will be notified and the sump pump(s) will start automatically to discharge the water until the water level drops to below the first float alarm point. If the accumulation of water reaches the second float alarm point, a high-high critical alarm will result in another notification to the Operator, and the well pump will automatically shut off. For this critical alarm, the Operator will follow the system upset notifications procedure described in Section 4.1.

Comment #5: Section 4.5.2 – Flow Meters, page 24:
"ADEQ noted that this section states that the low flow alarm value is 25 percent of the low normal operating flow. However, the low flow non-critical alarm values listed in section 4.5.6 are not 25 percent of the normal flow rates listed in section 4.2. ADEQ requests RID to clarify this information."

RID's Response:
Due to the SCADA system/critical alarm changes described in our response to Comment #6 (below), the wellhead low flow non-critical alarm control component has been removed from the wellhead treatment systems.

Comment #6: Section 4.5.6 – SCADA System, page 26:

a) *"In discussions with Synergy, it was indicated that the 40 pounds per square inch (psi) critical shut down at the well heads could not happen with the pumps installed in the wells. Therefore, the pump performance is only monitored by low flow rate which is not a critical alarm. ADEQ suggests that the 40 psi high pressure critical alarm be eliminated or that a lower, more relevant, critical pressure is derived from the well pump curves. ADEQ also suggests including a description of how the non-critical low flow rate, which requires only an operator response within two hours, is protective of 'public health against treatment system failure' [A.A.C. R18-16-411(E)(1)] ."*
b) *"ADEQ requests that RID discuss the feasibility of including a critical shut down at all wellhead treatment systems for low flow on one or more of the treatment train flow meters. ADEQ noted that Section 4.5.2 states that the flow meters have transmitters which are presumably monitored by the SCADA system. The reasoning behind this request is that if the treatment train flow meters record a low flow, there could be a*

significant upstream leak. A critical shut down would provide redundancy for the sump level shut down and would also account for leaks that could occur outside of the containment pad."

RID's Response:
As indicated by Synergy in its discussions with ADEQ, the high pressure critical alarm for each wellhead treatment system has been removed from the O&M Plan (Revision 5), and replaced with a low flow critical alarm for each of the nine (9) treatment skids as follows:

Condition	Alarm Value
RID-89 Low Flow Rate - Treatment Skid #1 (Critical)	780 gpm
RID-89 Low Flow Rate - Treatment Skid #2 (Critical)	780 gpm
RID-89 Low Flow Rate - Treatment Skid #3 (Critical)	780 gpm
RID-92 Low Flow Rate - Treatment Skid #1 (Critical)	990 gpm
RID-95 Low Flow Rate - Treatment Skid #2 (Critical)	675 gpm
RID-95 Low Flow Rate - Treatment Skid #3 (Critical)	675 gpm
RID-114 Low Flow Rate - Treatment Skid #1 (Critical)	675 gpm
RID-114 Low Flow Rate - Treatment Skid #2 (Critical)	675 gpm
RID-114 Low Flow Rate - Treatment Skid #3 (Critical)	675 gpm

The critical alarm value for each skid is calculated as 90% of the low treatment flow rate for the "normal operating value" included in Section 4.2 of the O&M Plan, divided by the number of treatment skids for that site. For example at RID-89:

- low treatment flow rate "normal operating value" = 2,600 gpm
- 90% of low treatment flow rate = 2,340 gpm
- Number of treatment skids = 3

***RID-89 Critical Flow Rate Per Skid** = 2,340 gpm/3 = **780 gpm**

Comment #7: Section 4.5.9 – Unplanned Shutdowns/System Operation Upset Events, page 27:
"The second bullet states that when the sump high-high set point is reached, the 3-way valve is activated and flow is diverted to the bypass piping; however, the response to ADEQ comment number 20 in the October 20, 2014 letter states that the high-high results in a system shut down, not a flow diversion. ADEQ requests RID to clarify this information."

RID's Response:
The second bullet of Section 4.5.9 has been corrected in the O&M Plan (Revision 5) to indicate that the well pump will automatically shut off.

Comment #8: Section 4.6.2 – Frequency and Locations of Sampling, page 29:
"The section states that the point of compliance samples are collected at sampling ports located down-stream of the treatment train skids as shown in Drawing 3-6. However, Figure 4 for RID-92 does not show the sampling port. ADEQ requests RID to clarify this information."

RID's Response:
The point of compliance sampling port has been added to a revised Figure 4, which is attached to this letter.

Comment #9: Section 6.2 – Progress Reports, page 34:
"ADEQ requests that RID include the weekly inspection forms in the monthly progress reports."

RID's Response:
Section 6.2 of the O&M Plan (Revision 5) has been revised to include the weekly inspection forms for each month in the Monthly Progress Reports.

We appreciate your prompt review of the attached revised *O&M Plan, RID Wellhead Treatment Systems* (Revision 5) text and Figure 4, and are available to meet at your convenience regarding any questions you may have.

Best Regards,
Synergy Environmental, LLC

Joel Peterson, PE

cc: Danielle Taber, Arizona Department of Environmental Quality
Donovan Neese, Roosevelt Irrigation District
David Kimball, Gallagher & Kennedy
Lawrence Moore, Lawrence Moore & Associates
Dennis Shirley, Synergy Environmental